

Claims

1. Use of a liquid crystal composition in a bistable liquid crystal device
said composition comprising

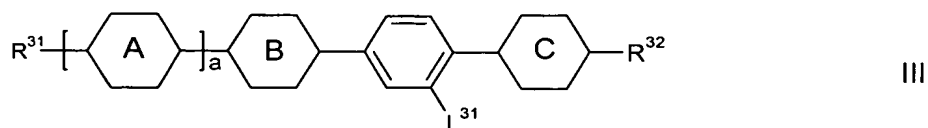
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- at least 30 weight% (based on the total weight of the composition) of a component (α) containing one or more compounds having a dielectric anisotropy $\Delta\epsilon$ of at least 25, whereby at least 25 weight% (based on the total weight of the composition) of said compounds have a dielectric anisotropy $\Delta\epsilon$ of at least 40; and
- at least 5 weight% (based on the total weight of the composition) of a component (β);

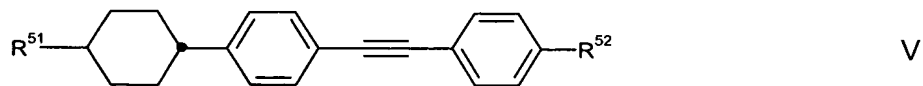
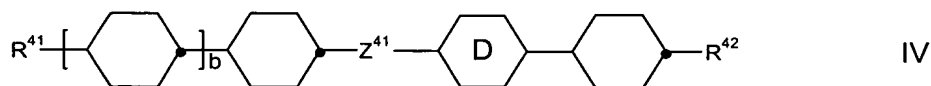
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whereby said component (β) comprises at least one compound of formula III and/or at least one compound of formula IV and/or at least one compound of formula V and/or at least one compound of formula VI and/or at least one compound of formula VII

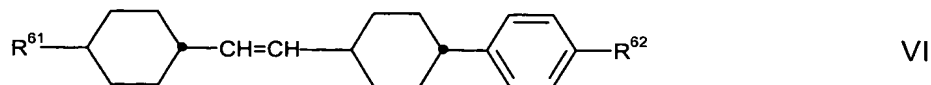
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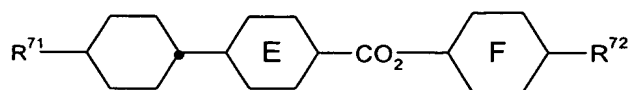


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VII

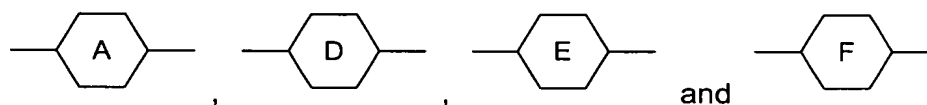
in which

a and b are independently of each other 0 or 1;

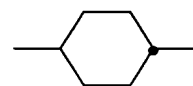
R^{31} , R^{32} , R^{41} , R^{42} , R^{51} , R^{52} , R^{61} , R^{62} , R^{71} and R^{72} are independently of each other C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

L^{31} is H or F;

Z^{41} is -CO-O-, -CH₂O-, -OCH₂-, -CF₂O-, -OCF₂-, -CH₂CH₂-, -CF₂CF₂-, -CH₂CF₂-, -CF₂CH₂-, -CH=CH- or -C≡C-;

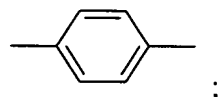


and

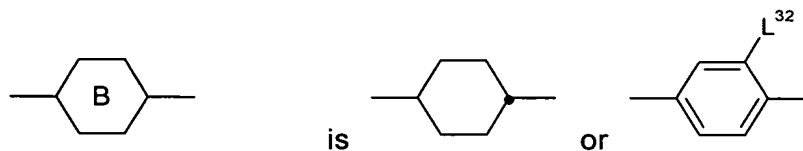


are independently of each other

or



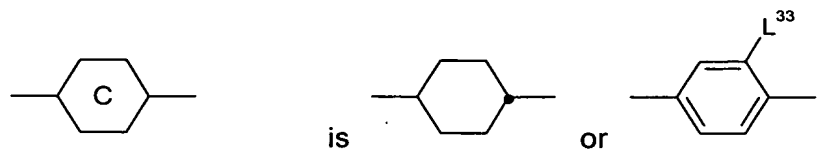
;



is

or

;



in which

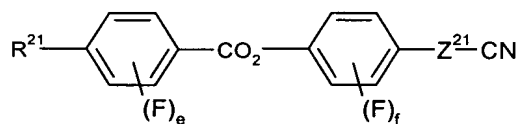
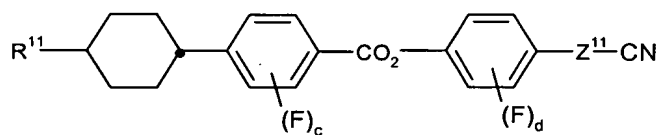
L^{32} and L^{33} are independently of each other H or F.

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2. Use of a liquid crystal composition according to claim 1 whereby said bistable liquid crystal device is a zenithal bistable nematic liquid crystal device.

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3. Use of a liquid crystal composition according to any one of claims 1 or 2 whereby said component (a) comprises at least one compound of formula I and/or at least one compound of formula II



in which

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c, d, e and f are independently of each other 0, 1, 2, 3 or 4;

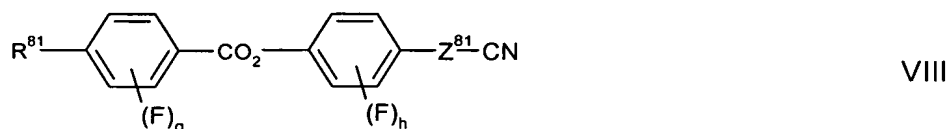
R^{11} is C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

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R^{21} is C_2 - C_{15} alkenyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C \equiv C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

Z^{11} and Z^{21} are independently of each other a single bond or -C \equiv C-.

4. Use of a liquid crystal composition according to any one of claims 1 to 3 whereby said component (α) comprises at least one compound of formula VIII



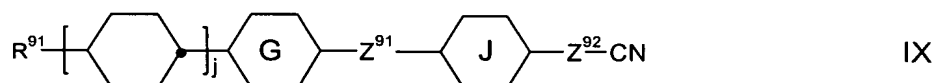
in which

g and h are independently of each other 0, 1, 2, 3 or 4;

R^{81} is C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -C \equiv C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

Z^{81} is a single bond or -C \equiv C-.

5. Use of a liquid crystal composition according to any one of claims 1 to 4 whereby said component (α) comprises at least one compound of formula IX

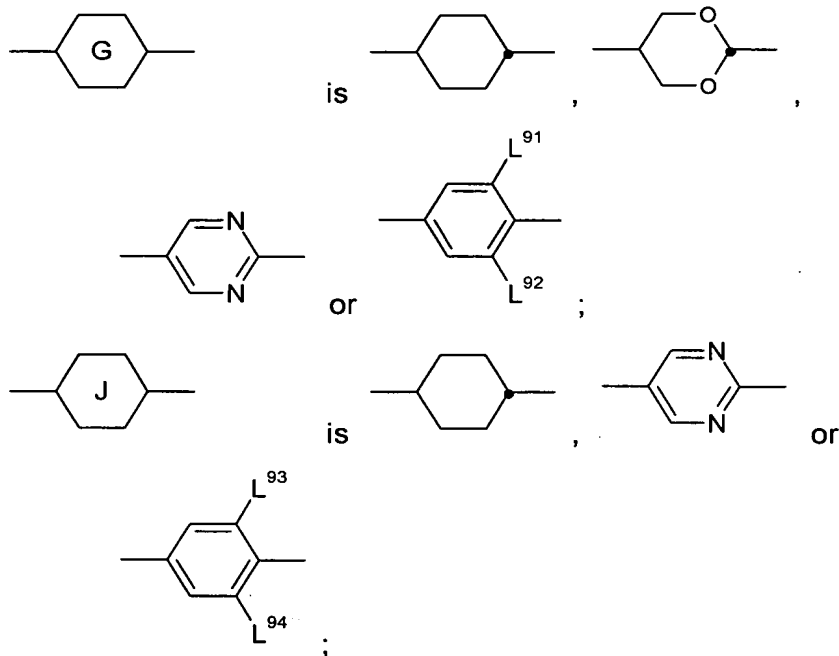


in which

j is 0 or 1;

R^{91} is C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced by $-O-$, $-S-$, $-CH=CH-$, $-C\equiv C-$, $-CO-O-$, $-OC-O-$ such that there are no hetero atoms adjacent to each other;

Z^{91} and Z^{92} are independently of each other a single bond or $-C\equiv C-$;

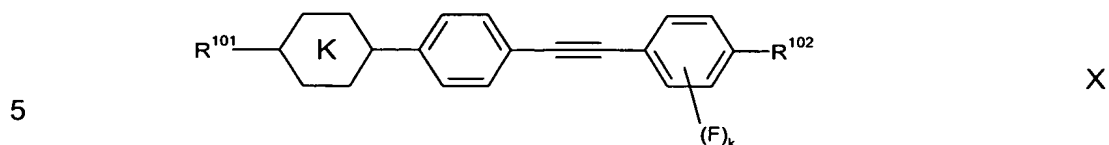


in which

L^{91} , L^{92} , L^{93} and L^{94} are independently of each other H or F.

6. Use of a liquid crystal composition according to any one of claims 1 to 5 whereby said liquid crystal composition further comprises
- at least 3 weight% (based on the total weight of the composition) of a component (γ) containing one or more compounds having an optical anisotropy Δn of at least 0.20.

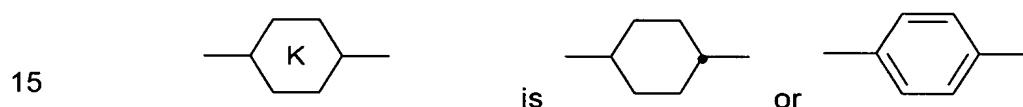
7. Use of a liquid crystal composition according to claim 6 whereby said component (γ) comprises at least one compound of formula X



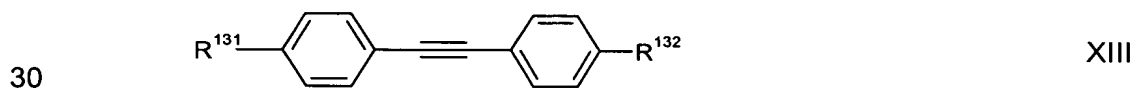
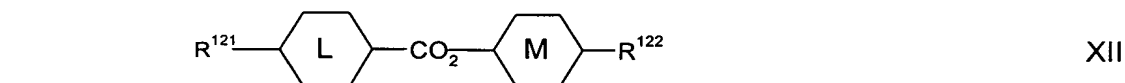
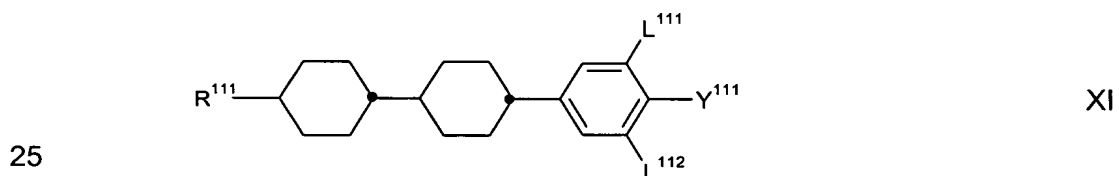
in which

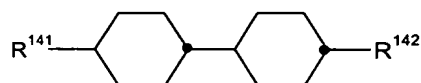
k is 0, 1, 2, 3 or 4;

10 R^{101} and R^{102} are independently of each other C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced by -O-, -S-, -CH=CH-, -C \equiv C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other; and



8. Use of a liquid crystal composition according to any one of claims 1 to 7 whereby said liquid crystal composition further comprises at least one compound of formula XI and/or at least one compound of formula XII and/or at least one compound of formula XIII at least one compound of formula XIV





XIV

in which

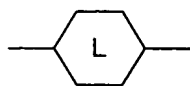
5 R^{111} and R^{142} are independently of each other C_2-C_{15} alkenyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by $-O-$, $-S-$, $-CH=CH-$, $-C\equiv C-$, $-CO-O-$, $-OC-O-$ such that there are no hetero atoms adjacent to each other;

10 R^{121} , R^{131} , R^{132} and R^{141} are independently of each other C_1-C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by $-O-$, $-S-$, $-CH=CH-$, $-C\equiv C-$, $-CO-O-$, $-OC-O-$ such that there are no hetero atoms adjacent to each other;

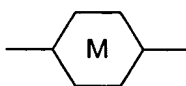
15 R^{122} is C_1-C_{15} alkyl which is unsubstituted or mono- or poly-substituted with halogen and in which one or more of the CH_2 groups may be replaced independently of each other by $-O-$, $-S-$, $-CH=CH-$, $-C\equiv C-$, $-CO-O-$, $-OC-O-$ such that there are no hetero atoms adjacent to each other;

20 Y^{111} is F, Cl, C_1-C_{15} alkanyl or C_2-C_{15} alkenyl that are independently of each other mono- or poly-substituted with halogen, or C_1-C_{15} alkoxy, which is mono- or poly-substituted with halogen;

25 L^{111} and L^{112} are independently of each other H or F; and

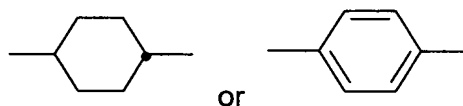


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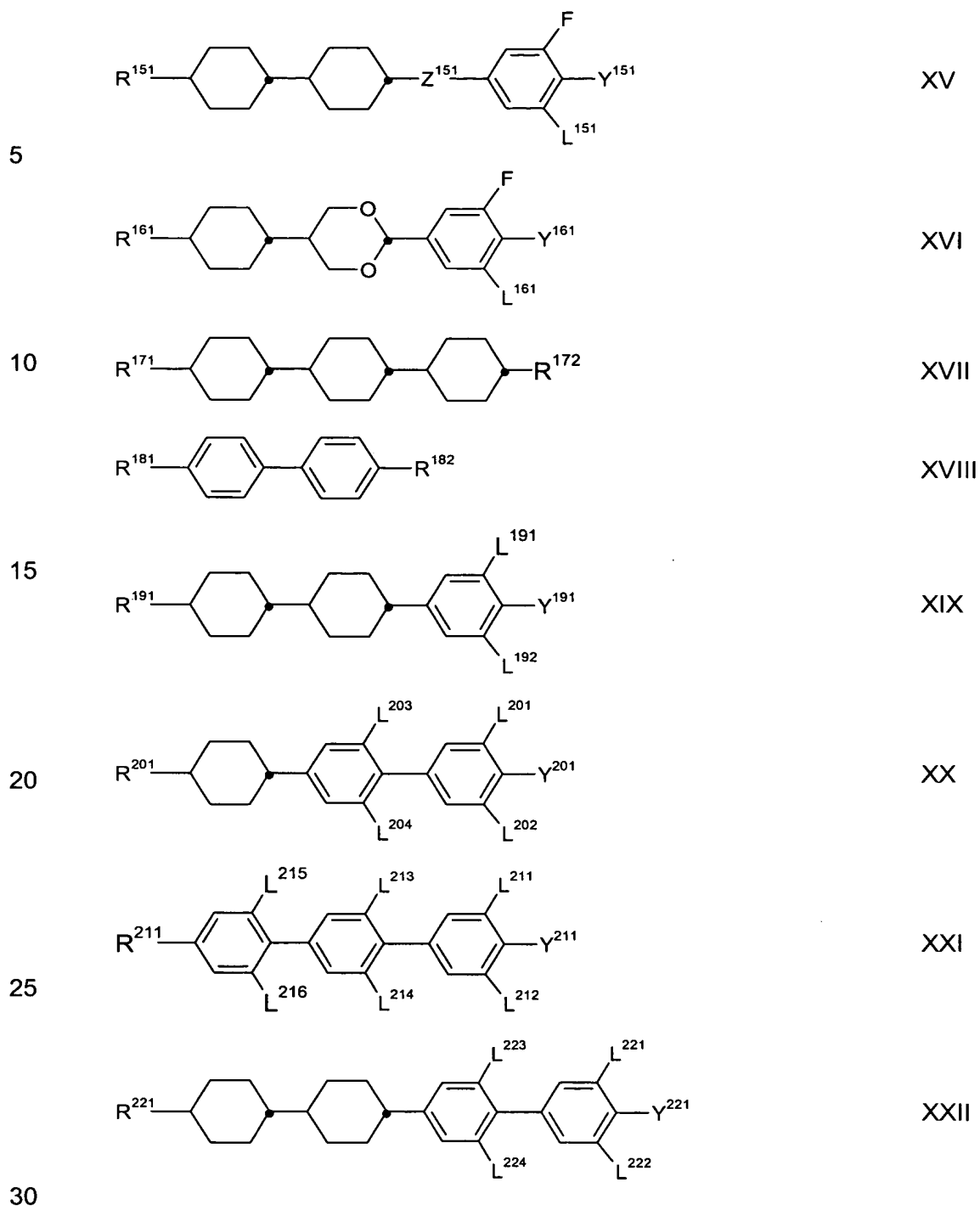


are independently of each other

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9. Use of a liquid crystal composition according to any one of claims 1 to 8 whereby said liquid crystal composition comprises at least 50 weight% (based on the total weight of the composition) of said component (α).
- 5
10. Use of a liquid crystal composition according to any one of claims 1 to 9 whereby said liquid crystal composition comprises at least 50 weight% (based on the total weight of the composition) of said component (α) whereby at least 30 weight% (based on the total weight of the composition) of said compounds have a dielectric anisotropy $\Delta\epsilon$ of at least 40.
- 10
11. Use of a liquid crystal composition according to any one of claims 1 to 10 whereby said liquid crystal composition comprises at least one compound of formula II of said component (α) and at least 8 weight% (based on the total weight of the composition) of said component (β).
- 15
12. Use of a liquid crystal composition according to any one of claims 6 to 11 whereby said liquid crystal composition comprises at least 5 weight% (based on the total weight of the composition) of said component (γ).
- 20
13. Use of a liquid crystal composition according to any one of claims 1 to 12 whereby said liquid crystal composition comprises at least one compound of formula XV and/or of formula XVI and/or XVII and/or of formula XVIII and/or of formula XIX and/or of formula XX and/or of formula XXI and/or of formula XXII:
- 25
- 30



in which

$R^{151}, R^{161}, R^{171}, R^{172}, R^{181}, R^{182}, R^{201}, R^{211}$ and R^{221}

are independently of each other C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

R^{191}

is C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

$Y^{151}, Y^{161}, Y^{191}, Y^{201}, Y^{211}$ and Y^{221}

are independently of each other F, Cl, C_1 - C_{15} alkanyl or C_2 - C_{15} alkenyl that are independently of each other mono- or poly-substituted with halogen, or C_1 - C_{15} alkoxy, which is mono- or poly-substituted with halogen;

$L^{151}, L^{161}, L^{191}, L^{192}, L^{201}, L^{202}, L^{203}, L^{204}, L^{211}, L^{212}, L^{213}, L^{214}, L^{215}, L^{216}, L^{221}, L^{222}, L^{223}$ and L^{224}

are independently of each other H or F;

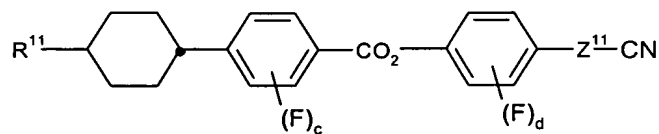
and

Z^{151}

is -CO-O-, CH_2O or CF_2O .

14. Liquid crystal medium comprising

- at least one compound of formula I

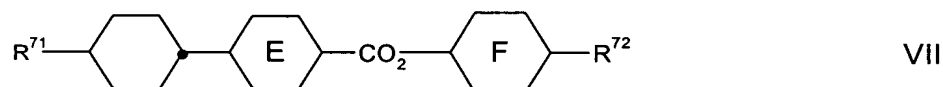
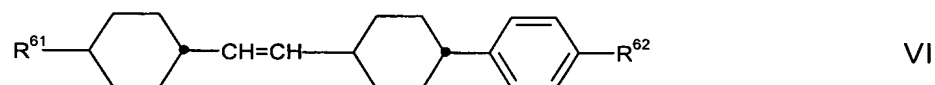
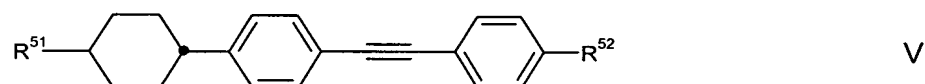
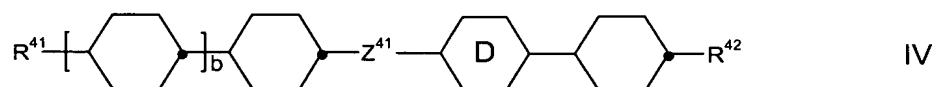
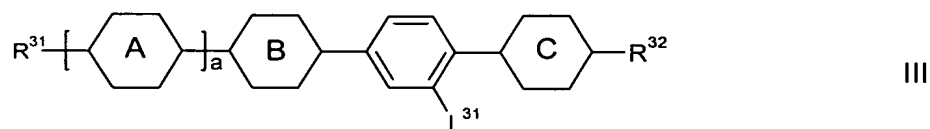


c and d are independently of each other 0, 1, 2, 3 or 4;

R^{11} is C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other; and

Z^{11} is a single bond or -C≡C-.

- at least one compound of formula III and/or at least one compound of formula IV and/or at least one compound of formula V and/or at least one compound of formula VI and/or at least one compound of formula VII



in which

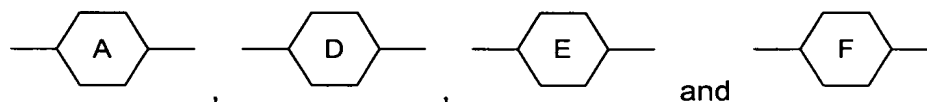
a and b are independently of each other 0 or 1;

R^{31} , R^{32} , R^{41} , R^{42} , R^{51} , R^{52} , R^{61} , R^{62} , R^{71} and R^{72} are independently of each other C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other; and

L^{31} is H or F;

Z^{41} is $-\text{CO}-\text{O}-$, $-\text{CH}_2\text{O}-$, $-\text{OCH}_2-$, $-\text{CF}_2\text{O}-$, $-\text{OCF}_2-$, $-\text{CH}_2\text{CH}_2-$,
 $-\text{CF}_2\text{CF}_2-$, $-\text{CH}_2\text{CF}_2-$, $-\text{CF}_2\text{CH}_2-$, $-\text{CH}=\text{CH}-$ or $-\text{C}\equiv\text{C}-$;

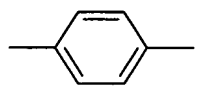
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are independently of each other

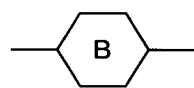
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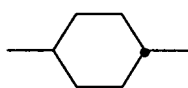


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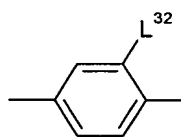
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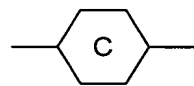
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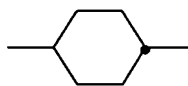
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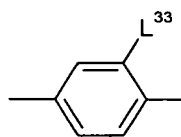
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is



or



;

in which

L^{32} and L^{33}

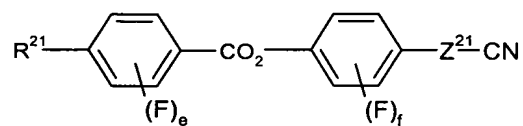
are independently of each other H or F.

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15. Liquid crystal medium comprising

- at least one compound of formula II

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II

in which

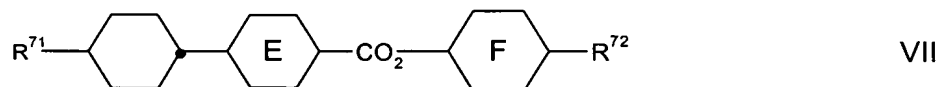
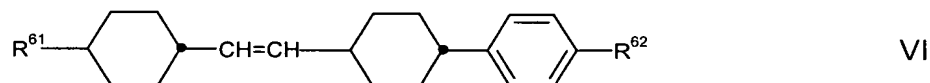
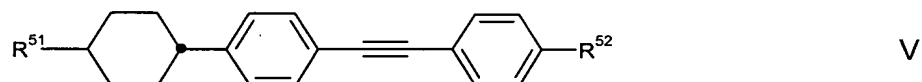
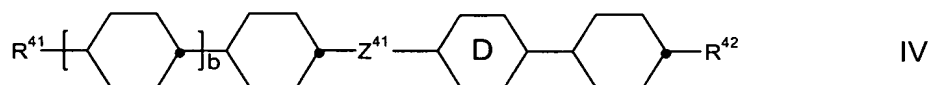
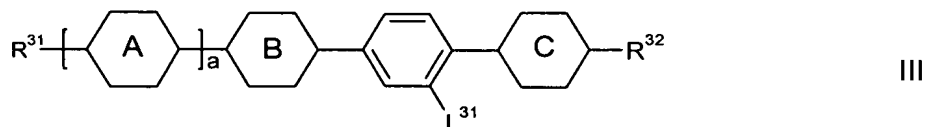
e and f are independently of each other 0, 1, 2, 3 or 4;

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R^{21} is C_2 - C_{15} alkenyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

Z^{21} is a single bond or -C≡C-.

- at least one compound of formula III and/or at least one compound of formula IV and/or at least one compound of formula V and/or at least one compound of formula VI and/or at least one compound of formula VII



in which

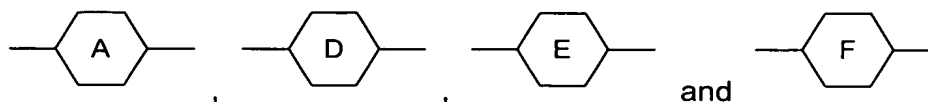
a and b are independently of each other 0 or 1;

R^{31} , R^{32} , R^{41} , R^{42} , R^{51} , R^{52} , R^{61} , R^{62} , R^{71} and R^{72} are independently of each other C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other; and

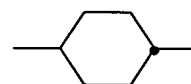
L^{31} is H or F;

Z^{41} is $-\text{CO}-\text{O}-$, $-\text{CH}_2\text{O}-$, $-\text{OCH}_2-$, $-\text{CF}_2\text{O}-$, $-\text{OCF}_2-$, $-\text{CH}_2\text{CH}_2-$,
 $-\text{CF}_2\text{CF}_2-$, $-\text{CH}_2\text{CF}_2-$, $-\text{CF}_2\text{CH}_2-$, $-\text{CH}=\text{CH}-$ or $-\text{C}\equiv\text{C}-$;

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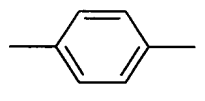


are independently of each other



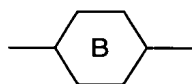
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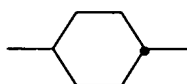


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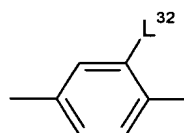
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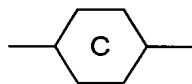
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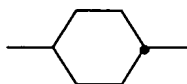
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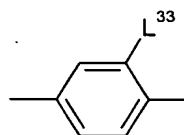
;



is



or



;

in which

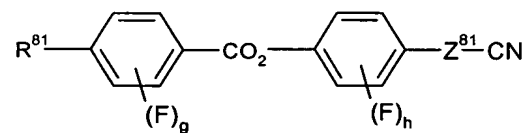
20

L^{32} and L^{33}

are independently of each other H or F.

16. Liquid crystal medium according to any one of claims 14 or 15 characterized in that said medium further comprises at least one compound of formula VIII

25



VIII

g and h are independently of each other 0, 1, 2, 3 or 4;

30

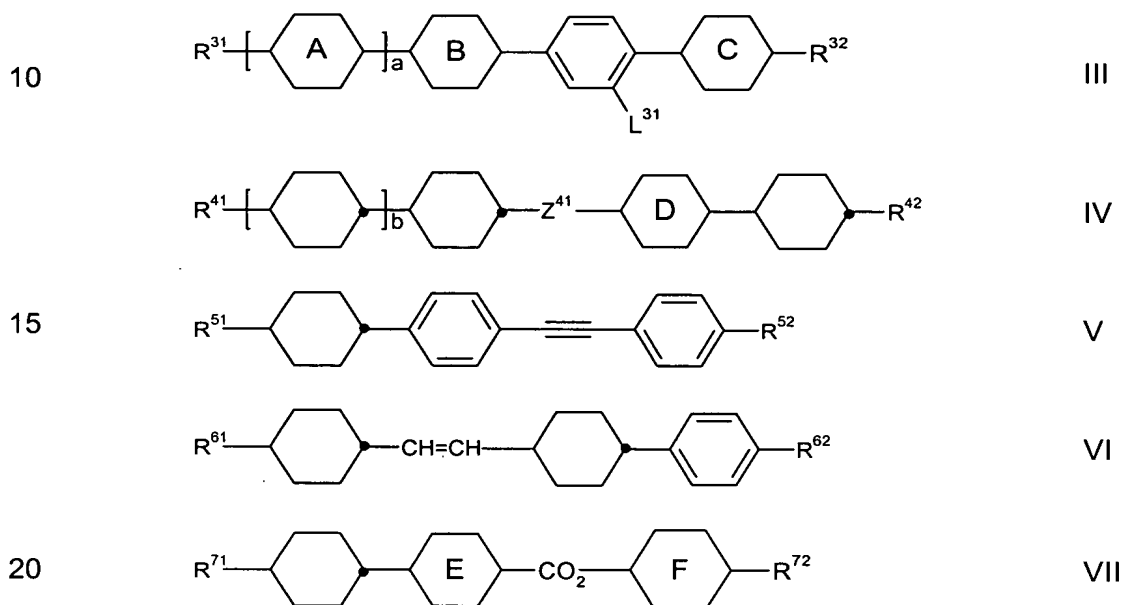
R^{81} is C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, $-C\equiv C-$, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

Z^{81} is a single bond or $-C\equiv C-$.

17. Bistable liquid crystal device comprising

- two outer substrates which, together with a frame, form a cell;
- a liquid crystal composition present in said cell;
- electrode structures with alignment layers on the inside of said outer substrates whereby at least one alignment layer comprises an alignment grating that permits the compounds of said liquid crystal composition to adopt at least two different stable states whereby the assembly of said electrode structures with said alignment layers being such that a switching between the said at least two different stable states is achieved by applying suitable electric signals to said electrode structures;
- whereby said liquid crystal composition comprises
 - at least 30 weight% (based on the total weight of the composition) of a component (α) containing one or more compounds having a dielectric anisotropy $\Delta\epsilon$ of at least 25, whereby at least 25 weight% (based on the total weight of the composition) of said compounds have a dielectric anisotropy $\Delta\epsilon$ of at least 40; and

- at least 5 weight% (based on the total weight of the composition) of a component (β);
whereby said component (β) comprises at least one compound of formula III and/or at least one compound of formula IV and/or at least one compound of formula V and/or at least one compound of formula VI and/or at least one compound of formula VII



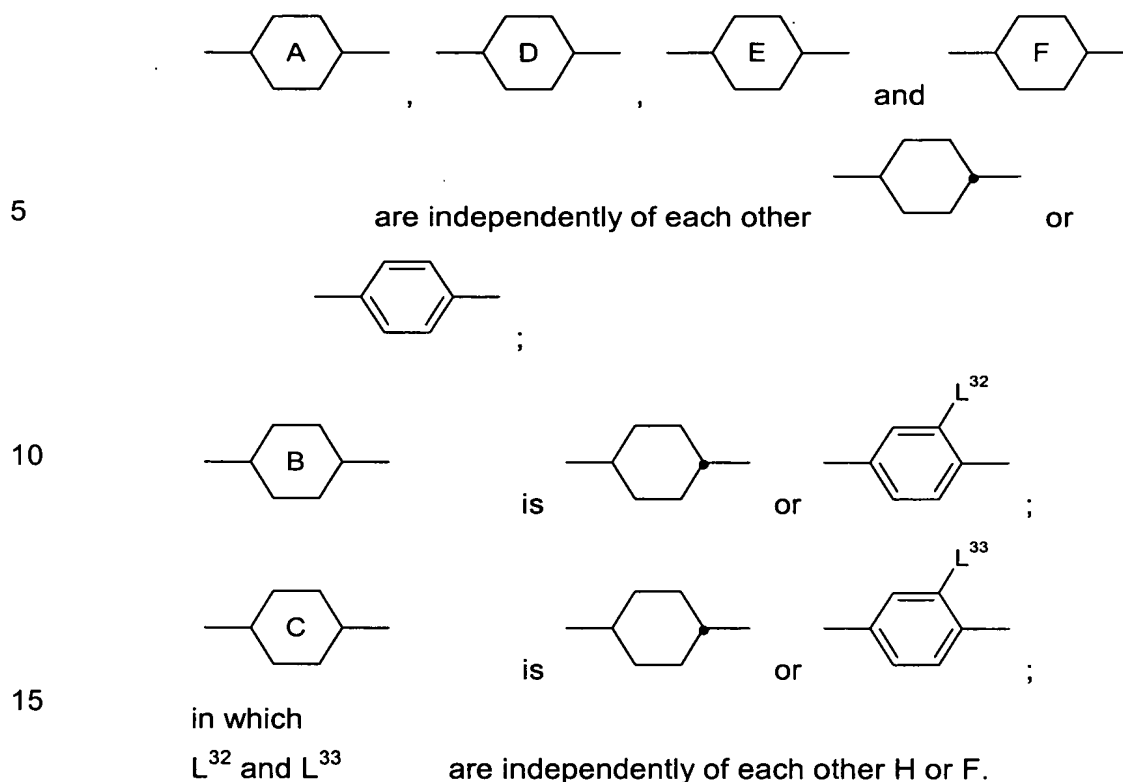
in which

a and b are independently of each other 0 or 1;

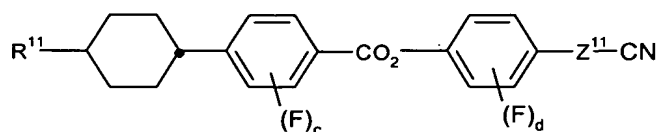
R^{31} , R^{32} , R^{41} , R^{42} , R^{51} , R^{52} , R^{61} , R^{62} , R^{71} and R^{72} are independently of each other C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other; and

L^{31} is H or F;

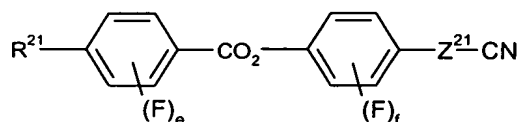
Z^{41} is -CO-O-, -CH₂O-, -OCH₂-, -CF₂O-, -OCF₂-, -CH₂CH₂-, -CF₂CF₂-, -CH₂CF₂-, -CF₂CH₂-, -CH=CH- or -C≡C-;



18. Bistable liquid crystal device according to claim 17 whereby
- 20 ■ said device is a zenithal bistable nematic liquid crystal device;
 and
- 25 ■ said electrode structures with alignment layers on the inside of
 said outer substrates have at least one alignment layer that
 comprises an alignment grating that permits the compounds of
 said liquid crystal composition to adopt at least two different stable
 states with different pretilt angles in the same azimuthal plane.
19. Bistable liquid crystal device according to any one of claims 17 or 18
 whereby said component (α) comprises at least one compound of
 formula I and/or at least one compound of formula II
- 30



I



II

in which

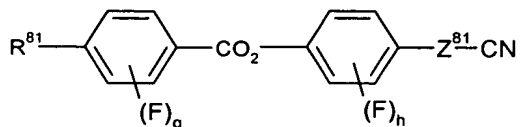
c, d, e and f are independently of each other 0, 1, 2, 3 or 4;

R^{11} is C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

R^{21} is C_2 - C_{15} alkenyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

Z^{11} and Z^{21} are independently of each other a single bond or -C≡C-.

20. Bistable liquid crystal device according to any one of claims 18 to 19 whereby said component (α) comprises at least one compound of formula VIII



VIII

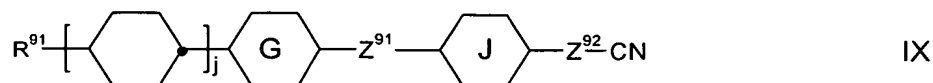
in which

g and h are independently of each other 0, 1, 2, 3 or 4;

R^{81} is C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, $-C\equiv C-$, $-CO-O-$, $-OC-O-$ such that there are no hetero atoms adjacent to each other;

Z^{81} a single bond or $-C\equiv C-$.

21. Bistable liquid crystal device according to any one of claims 17 to 20 whereby said component (α) comprises at least one compound of formula IX

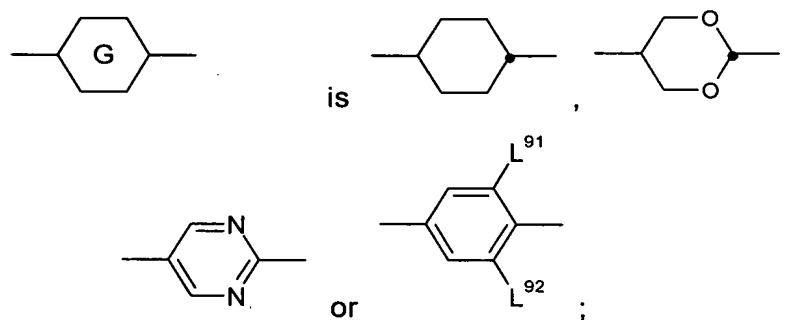


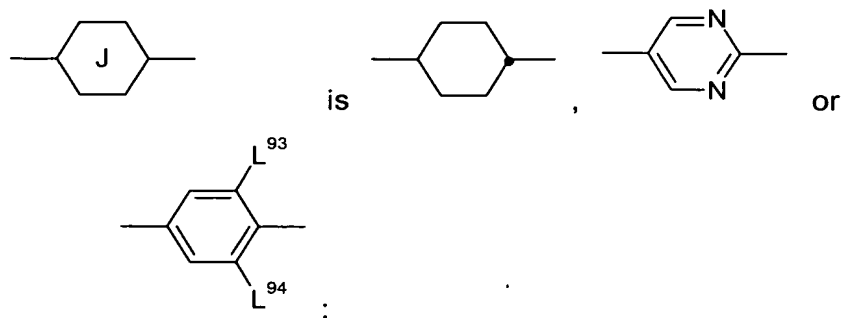
in which

j is 0 or 1;

R^{91} is C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced by -O-, -S-, $-CH=CH-$, $-C\equiv C-$, $-CO-O-$, $-OC-O-$ such that there are no hetero atoms adjacent to each other;

Z^{91} and Z^{92} are independently of each other a single bond or $-C\equiv C-$;



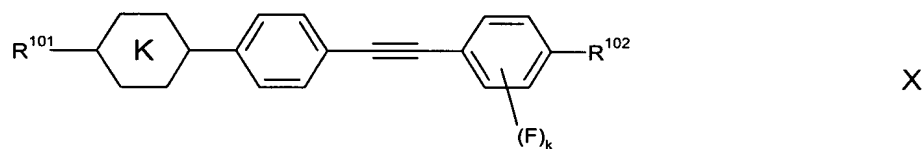


in which

L^{91} , L^{92} , L^{93} and L^{94} are independently of each other H or F.

22. Bistable liquid crystal device according to any one of claims 17 to 21 whereby said liquid crystal composition further comprises
- at least 3 weight% (based on the total weight of the composition) of a component (γ) containing one or more compounds having an optical anisotropy Δn of at least 0.20.

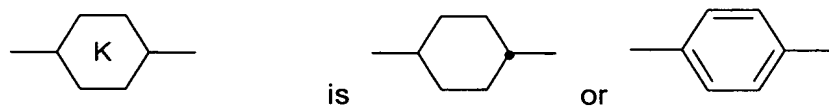
23. Bistable liquid crystal device according to claim 22 whereby said component (γ) comprises at least one compound of formula X



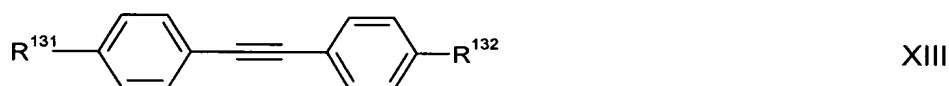
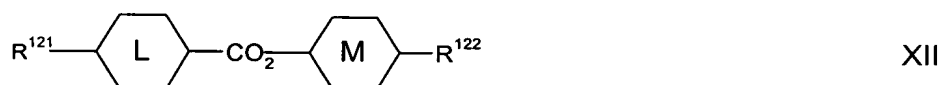
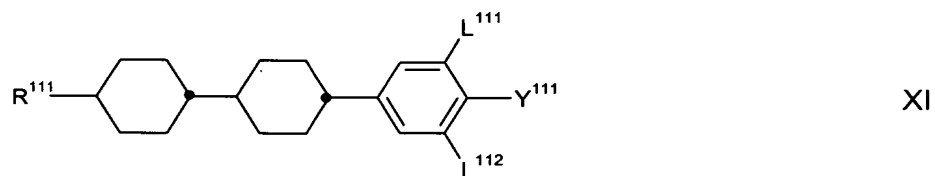
in which

k is 0, 1, 2, 3 or 4;

R^{101} and R^{102} are independently of each other C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other; and



24. Bistable liquid crystal device according to any one of claims 17 to 23 whereby said liquid crystal composition further comprises at least one compound of formula XI and/or at least one compound of formula XII and/or at least one compound of formula XIII and/or at least one compound of formula XIV



in which

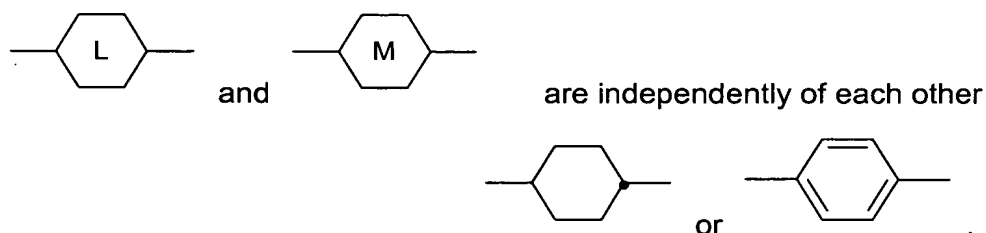
R^{111} and R^{142} are independently of each other C_2 - C_{15} alkenyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

R^{121} , R^{131} , R^{132} and R^{141} are independently of each other C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C≡C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

R^{122} is C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with halogen and in which one or more of the CH_2 groups may be replaced independently of each other by $-O-$, $-S-$, $-CH=CH-$, $-C\equiv C-$, $-CO-O-$, $-OC-O-$ such that there are no hetero atoms adjacent to each other;

Y^{111} is F, Cl, C_1 - C_{15} alkanyl or C_2 - C_{15} alkenyl that are independently of each other mono- or poly-substituted with halogen, or C_1 - C_{15} alkoxy, which is mono- or poly-substituted with halogen;

L^{111} and L^{112} are independently of each other H or F; and



25. Bistable liquid crystal device according to any one of claims 17 to 24 whereby said liquid crystal composition comprises at least 50 weight% (based on the total weight of the composition) of said component (α).

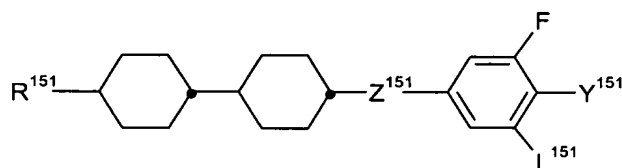
26. Bistable liquid crystal device according to any one of claims 17 to 25 whereby said liquid crystal composition comprises at least 50 weight% (based on the total weight of the composition) of said component (α) whereby at least 30 weight% (based on the total weight of the composition) of said compounds have a dielectric anisotropy $\Delta\epsilon$ of at least 40.

27. Bistable liquid crystal device according to any one of claims 17 to 26 whereby said liquid crystal composition comprises at least one compound of formula II of said component (α) and at least 8 weight% (based on the total weight of the composition) of said component (β).

28. Bistable liquid crystal device according to any one of claims 22 to 27 whereby said liquid crystal composition comprises at least 5 weight% (based on the total weight of the composition) of said component (γ).

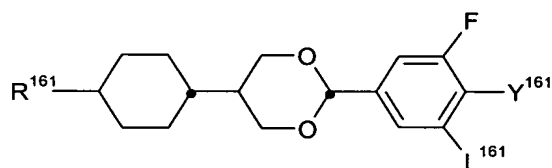
5 29. Bistable liquid crystal device according to any one of claims 17 to 28 whereby said liquid crystal composition comprises at least one compound of formula XV and/or of formula XVI and/or XVII and/or of formula XVIII and/or of formula XIX and/or of formula XX and/or of formula XXI and/or of formula XXII:

10

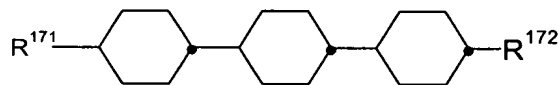


XV

15

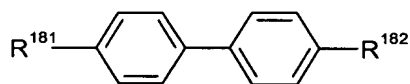


XVI



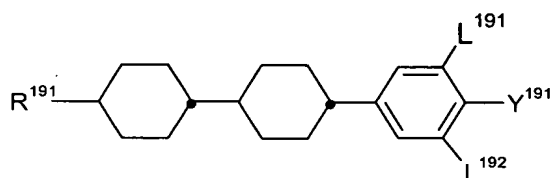
XVII

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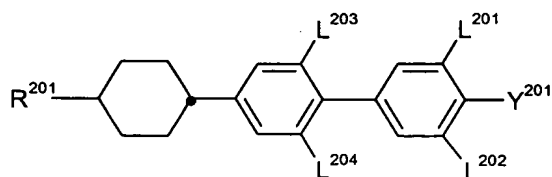
XVIII

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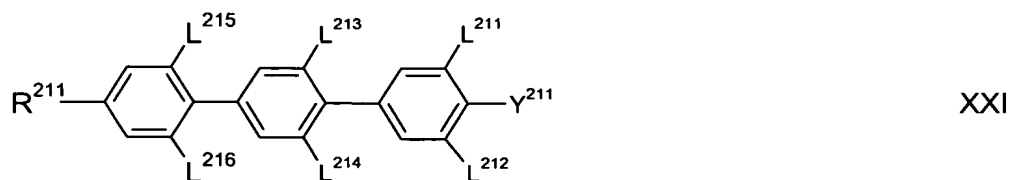


XIX

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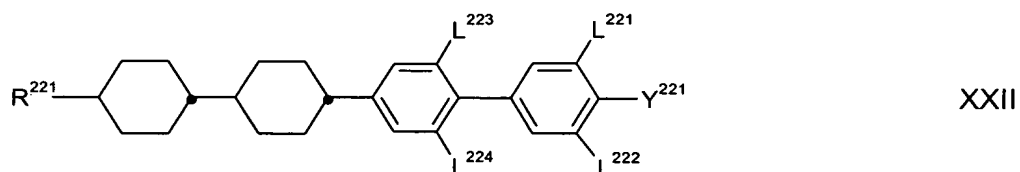


XX



XXI

5



XXII

in which

10

 $R^{151}, R^{161}, R^{171}, R^{172}, R^{181}, R^{182}, R^{201}, R^{211}$ and R^{221}

are independently of each other C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -CH=CH-, -C \equiv C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other;

15

R^{191} is C_1 - C_{15} alkyl which is unsubstituted or mono- or poly-substituted with CN or halogen and in which one or more of the CH_2 groups may be replaced independently of each other by -O-, -S-, -C \equiv C-, -CO-O-, -OC-O- such that there are no hetero atoms adjacent to each other (i.e. R^{191} does not represent an alkenyl radical);

20

$Y^{151}, Y^{161}, Y^{191}, Y^{201}, Y^{211}$ and Y^{221} are independently of each other F, Cl, C_1 - C_{15} alkanyl or C_2 - C_{15} alkenyl that are independently of each other mono- or poly-substituted with halogen, or C_1 - C_{15} alkoxy which is mono- or poly-substituted with halogen;

25

$L^{151}, L^{161}, L^{191}, L^{192}, L^{201}, L^{202}, L^{203}, L^{204}, L^{211}, L^{212}, L^{213}, L^{214}, L^{215}, L^{216}, L^{221}, L^{222}, L^{223}$ and L^{224} are independently of each other H or F;

30

and

Z^{151} is -CO-O-, CH_2O or CF_2O .